

Chemical Analysis Report

WQ-ASSESS-2017-04-12-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Killearn Outlet, Moriah Creek**

Request ID: **RQ-2017-04-10-20**

Customer: **WQ-ASSESS**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
Division Of Water Facilities, FL DEP
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 08-MAY-2017 12:57



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Moriah Creek 100 Meters upstream of Newport Rd **Collection Date/Time: 04/12/2017 08:49**

Field ID: G1WA0057_04122017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888364	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P323526	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P323745	
		Sulfate	0.94		mg SO4/L	P323747	
	SM 2120 B	Color (true)	88	A	PCU	P323270	
	SM 2320 B-97	Total Alkalinity	155		mg CaCO3/L	P323889	
	SM 2540 C-97	TDS	194	A	mg/L	P323656	
	SM 2540 D-97	TSS	3	IA	mg/L	P323888	
	SM 4500 F-C-97	Fluoride	0.078	I	mg F/L	P324403	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P323277	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P323382	
1888366	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323400	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P323425	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P323470	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P323299	
	dissolved						

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Lafayette Drain 250 meters downstream of Weems Rd **Collection Date/Time: 04/12/2017 13:31**

Field ID: G1WA0007_04122017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888365	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P323526	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P323745	
		Sulfate	20		mg SO4/L	P323747	
	SM 2120 B	Color (true)	7.3		PCU	P323270	
	SM 2320 B-97	Total Alkalinity	49		mg CaCO3/L	P323889	
	SM 2540 C-97	TDS	95		mg/L	P323656	
	SM 2540 D-97	TSS	2	I	mg/L	P323888	
	SM 4500 F-C-97	Fluoride	0.061	I	mg F/L	P324403	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P323277	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P323382	
1888367	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P323400	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P323428	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P323470	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	I	mg P/L	P323299	
	dissolved						

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Lafayette Drain 250 meters downstream of Weems Rd **Collection Date/Time: 04/12/2017 13:31**

Field ID: G1WA0007_04122017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888375	EPA 200.7 Rev. 4.4	Calcium	19.9		mg/L	P323578	
		Iron	140		ug/L	P323578	
		Magnesium	5.79		mg/L	P323578	
		Potassium	1.2	I	mg/L	P323578	
		Sodium	3.0		mg/L	P323578	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P323578	
		Arsenic	0.35		ug/L	P323578	
		Cadmium	0.020	U	ug/L	P323578	
		Chromium	0.40	U	ug/L	P323578	
		Copper	0.43	I	ug/L	P323578	
		Lead	0.11	I	ug/L	P323578	
		Nickel	0.20	U	ug/L	P323578	
		Silver	0.010	U	ug/L	P323578	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323526

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323578

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323578

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323745

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323747

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323277

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323382

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323400

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323425

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323428

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323299

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P323270

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P323889

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
 Batch ID: P323656

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P323888

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P324403

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P323470

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P323578

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P323578

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	92.8		P	85 - 115
Cadmium	94.4		P	85 - 115
Chromium	99.8		P	85 - 115
Copper	91.0		P	85 - 115
Lead	96.1		P	85 - 115
Nickel	91.9		P	85 - 115
Silver	96.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	100		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323747

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P323277

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	102		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P323382

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P323400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P323425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P323428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P323299

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2320 B-97
 Batch ID: P323889

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P324403

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00

Batch ID: P323470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P323578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887977	Calcium	108		P	80 - 120
1887977	Iron	106		P	80 - 120
1887977	Magnesium	107		P	80 - 120
1887977	Potassium	108		P	80 - 120
1887977	Sodium	104		P	80 - 120
1887977	Zinc	104		P	80 - 120
1888375	Calcium	103		P	80 - 120
1888375	Iron	104	106	P/P	80 - 120
1888375	Magnesium	102		P	80 - 120
1888375	Potassium	103	104	P/P	80 - 120
1888375	Sodium	101	104	P/P	80 - 120
1888375	Zinc	99.3	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P323578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887977	Arsenic	95.1		P	80 - 120
1887977	Cadmium	97.4		P	80 - 120
1887977	Chromium	104		P	80 - 120
1887977	Copper	95.9		P	80 - 120
1887977	Lead	98.4		P	80 - 120
1887977	Nickel	93.8		P	80 - 120
1887977	Silver	98.3		P	80 - 120
1888375	Arsenic	95.2	94.4	P/P	80 - 120
1888375	Cadmium	98.1	96.9	P/P	80 - 120
1888375	Chromium	101	101	P/P	80 - 120
1888375	Copper	89.5	90.2	P/P	80 - 120
1888375	Lead	96.8	96.8	P/P	80 - 120
1888375	Nickel	92.0	92.4	P/P	80 - 120
1888375	Silver	97.7	97.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P323745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887928	Chloride	100		P	90 - 110
1888029	Chloride	99.5		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P323747

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887928	Sulfate	93.4		P	90 - 110
1888029	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P323277

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888101	Ammonia-N	101	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P323400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887941	NO2NO3-N	95.0	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P323425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888101	Total-P	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P323428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888520	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P323299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888368	O-Phosphate-P	96.4	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P324403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888726	Fluoride	104	103	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P323470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888031	Organic Carbon	104	104	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888309	Turbidity	3.83	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888375	Calcium	1.60	Spike	P	0 - 20
1888375	Iron	1.91	Spike	P	0 - 20
1888375	Magnesium	2.02	Spike	P	0 - 20
1888375	Potassium	0.919	Spike	P	0 - 20
1888375	Sodium	1.63	Spike	P	0 - 20
1888375	Zinc	3.18	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888375	Arsenic	0.771	Spike	P	0 - 20
1888375	Cadmium	1.24	Spike	P	0 - 20
1888375	Chromium	0.513	Spike	P	0 - 20
1888375	Copper	0.821	Spike	P	0 - 20
1888375	Lead	0.0618	Spike	P	0 - 20
1888375	Nickel	0.464	Spike	P	0 - 20
1888375	Silver	0.0724	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888029	Chloride	0.0975	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P323747

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888029	Sulfate	0.113	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888101	Ammonia-N	1.57	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888467	Kjeldahl Nitrogen	0.0871	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887941	NO2NO3-N	1.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888101	Total-P	2.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888520	Total-P	0.396	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888368	O-Phosphate-P	0.724	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P323270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888364	Color (true)	0.400	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P323889

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888726	Total Alkalinity	0.299	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P323656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888364	TDS	1.03	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P324403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888726	Fluoride	0.558	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P323470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888031	Organic Carbon	0.462	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A75749
Included Lab Sample IDs: 1888364, 1888365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75750
Included Lab Sample IDs: 1888366, 1888367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75757
Included Lab Sample IDs: 1888368, 1888369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A75786
Included Lab Sample IDs: 1888366, 1888367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.0	92.5	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A75802
Included Lab Sample IDs: 1888366, 1888367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75819

Included Lab Sample IDs: 1888366, 1888367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.7	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75826

Included Lab Sample IDs: 1888366, 1888367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.0	P/P	90 - 110
Total-P	99.0	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A75831

Included Lab Sample IDs: 1888364, 1888365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75903

Included Lab Sample IDs: 1888364, 1888365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	100	P/P	90 - 110
Sulfate	96.0	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75916

Included Lab Sample IDs: 1888375

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	91.9	91.5	P/P	90 - 110
Chromium	99.5	98.3	P/P	90 - 110
Copper	91.8	91.4	P/P	90 - 110
Lead	94.8	93.8	P/P	90 - 110
Nickel	91.8	91.3	P/P	90 - 110
Silver	94.7	94.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75945

Included Lab Sample IDs: 1888375

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	96.1	96.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A75952

Included Lab Sample IDs: 1888364, 1888365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A76018

Included Lab Sample IDs: 1888375

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	102	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	101	99.9	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A76126

Included Lab Sample IDs: 1888364, 1888365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.0	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.83	
EPA 200.7 Rev. 4.4	Calcium	104	108	103				1.60
	Iron	103	106	104	106			1.91
	Magnesium	103	107	102				2.02
	Potassium	103	108	103	104			0.919
	Sodium	104	104	101	104			1.63
	Zinc	99.8	104	99.3	103			3.18
EPA 200.8 Rev. 5.4	Arsenic	92.8	95.1	95.2	94.4			0.771
	Cadmium	94.4	97.4	98.1	96.9			1.24
	Chromium	99.8	104	101	101			0.513
	Copper	91.0	95.9	89.5	90.2			0.821
	Lead	96.1	98.4	96.8	96.8			0.0618
	Nickel	91.9	93.8	92.0	92.4			0.464
	Silver	96.0	98.3	97.7	97.8			0.0724
EPA 300.0 Rev. 2.1	Chloride	100	99.5	100			0.0975	
	Sulfate	97.5	97.3	93.4			0.113	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	98.5				1.57
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.2						0.0871
EPA 353.2 Rev. 2.0	NO2NO3-N	96.0	95.0	94.0				1.06
EPA 365.1 Rev. 2.0	Total-P	98.8	103	100				2.05
	Total-P	102	102	102				0.396
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	96.4	97.1				0.724
SM 2120 B	Color (true)						0.400	
SM 2320 B-97	Total Alkalinity	105					0.299	
SM 2540 C-97	TDS						1.03	
SM 4500 F-C-97	Fluoride	94.7	104	103				0.558
SM 5310 B-00	Organic Carbon	105	104	104				0.462

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1888364, 1888365
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1888375
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1888375
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1888364, 1888365
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1888364, 1888365
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1888366, 1888367
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1888366, 1888367
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1888366, 1888367
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1888366, 1888367
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1888368, 1888369
SM 2120 B / E31780	True Color measured at 450 nm	1888364, 1888365
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1888364, 1888365
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1888364, 1888365
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1888364, 1888365
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1888364, 1888365
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1888366, 1888367

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	04/12/2017			04/13/2017 16:21	Sima Feizi	1888364, 1888365
EPA 200.7 Rev. 4.4	04/12/2017	04/18/2017	Elliott D. Healy	04/26/2017	Martin Acosta	1888375
EPA 200.8 Rev. 5.4	04/12/2017	04/18/2017	Elliott D. Healy	04/21/2017	Betina Topolski	1888375
EPA 300.0 Rev. 2.1	04/12/2017			04/20/2017	Ping Hua	1888364, 1888365
EPA 350.1 Rev. 2.0	04/12/2017			04/12/2017	Julie Michelle Frank	1888366, 1888367
EPA 351.2 Rev. 2.0	04/12/2017	04/14/2017	Adrian Shelby	04/17/2017	Joseph Suarez	1888366, 1888367
EPA 353.2 Rev. 2.0	04/12/2017			04/14/2017	Beverly Y. Sanders	1888366, 1888367
EPA 365.1 Rev. 2.0	04/12/2017	04/14/2017	Vijayalakshmi Reddy	04/17/2017	Lipi Saha	1888366, 1888367
EPA 365.1 Rev. 2.0 dissolved	04/12/2017			04/13/2017 09:58	Anthony C. Onicha	1888368
	04/12/2017			04/13/2017 10:01	Anthony C. Onicha	1888369
SM 2120 B	04/12/2017			04/12/2017 16:31	Julia Storbeck	1888364, 1888365
SM 2320 B-97	04/12/2017			04/22/2017	Dale L. Simmons	1888364, 1888365
SM 2540 C-97	04/12/2017			04/14/2017	Yijie Li	1888364, 1888365
SM 2540 D-97	04/12/2017			04/14/2017	Yijie Li	1888364, 1888365
SM 4500 F-C-97	04/12/2017			05/01/2017	Dale L. Simmons	1888364, 1888365
SM 5310 B-00	04/12/2017			04/14/2017	Julie Michelle Frank	1888366, 1888367